

IN THE CLAIMS:

1. (Currently Amended) An arrangement for cooling a circuit board (2) ~~or the like, which arrangement comprises:~~ comprising a generally flat carrier frame (4); ~~that comprises~~ elements (41, 43, 44; 80) ~~for connection~~ connecting said frame to the circuit board (2) and ~~for supporting said frame~~ thereon; a ring-like air passthrough aperture (47); and a miniature ~~or subminiature~~ fan (3) that is mounted on ~~the~~ a first side (C) of the carrier frame (4) facing away from the circuit board (2) and at a distance from the circuit board, and is equipped with a fan wheel (31) that, during operation, rotates about a rotation axis (A) and transports air through the annular air passthrough aperture (47),

there being provided on the carrier frame (4), on the side of the air passthrough aperture (47) facing toward the circuit board (2), an air-directing element (5) which serves to deflect the flow direction of at least a portion of the air transported, during operation, through the air passthrough aperture (47).

2. (Currently Amended) The arrangement according to claim 1, wherein the air-directing element (5) is ~~implemented~~ approximately in the manner of configured as a bell that widens in ~~the~~ a radial direction (R) away from the fan (3).

3. (Currently Amended) The arrangement according to claim 1 ~~or~~ 2,

wherein the carrier frame (4) comprises, radially inside the air passthrough aperture (47), a support member (45) on which the fan (3) is arranged.

4. (Currently Amended) The arrangement according to claim 3, wherein the support member (45) is joined, via struts ~~or the like~~ (45a), to a part (40) of the carrier frame (4) located radially outside the air passthrough aperture (47).

5. (Currently Amended) The arrangement according to claim 4, wherein the part (40) of the carrier frame (4) located outside the air passthrough aperture (47) is ~~implemented in the manner of~~ configured as a tubular segment.

6. (Currently Amended) The arrangement according to claim 3, ~~any of claims 3 to 5, wherein further comprising~~
an electronically commutated motor (33) ~~that is~~ mounted on the support member (45) ~~is provided in order and coupled~~ to drive the fan (3); and
a circuit plate (6), which ~~is implemented to connect~~ connects the motor (33) to electrical connecting leads (61), and is arranged between that motor (33) and the support member (45).

7. (Currently Amended) The arrangement according to claim 6, wherein the circuit plate (6) comprises electronic components for commutation of the motor (33) serving to drive the fan ~~wheel (31)~~.

8. (Currently Amended) The arrangement according to claim 6 ~~or 7~~, wherein the electrical connecting leads (62) are guided in the carrier frame (4), and are implemented at their circuit-board end (D) for electrical contacting with the circuit board (2).

9. (Currently Amended) The arrangement according to claim 8, wherein the connecting leads are implemented as wire connections (61) that are at least partially surrounded by a sheath (51).
~~that is constituted by parts of the carrier frame (4) and/or of the air-directing element (5).~~

10. (Currently Amended) The arrangement according to claim 5, wherein
said fan includes a fan wheel (31) having an outer side which
~~the outer side of the fan wheel (31)~~, together with the an inner side (47a) of the part (40) implemented in the manner of a tubular segment, forms an annular space (47) inside which, during operation, ~~the~~ blades (32) of the fan wheel (31) rotate.

11. (Original) The arrangement according to claim 10,
wherein the cross section of the annular space (47)
widens in the direction toward its outlet.

12. (Currently Amended) The arrangement according to claim 1,
~~any of the preceding claims~~,
wherein the carrier frame (4) comprises, on its side facing
away from the circuit board, an end surface (42) on which a sealing
ring (7) is arranged.

13. (Currently Amended) The arrangement according to
claim 12,
wherein a depression, inside which the fan (3) is arranged,
is provided inside the end surface (42) of said carrier frame.

14. (Currently Amended) The arrangement according to claim 1,
~~any of the preceding claims~~,
wherein the air-directing member (5) is ~~equipped~~ formed with
penetrations (60, 62; 64, 66; 68; 70, 72; 74, 76, 78) in order to
direct, through a wall of the air-directing member (5), a portion of
the air flow delivered by the fan (3).

15. (Currently Amended) The arrangement according to claim 1,
~~any of the preceding claims~~, wherein
the fan (3) is ~~implemented~~ arranged to transport, through the
air passthrough aperture (47), air coming from the air-directing
element (5).

16. (Currently Amended) The arrangement according to claim 1,
~~any of the preceding claims~~,
wherein the fan (3) is ~~implemented~~ arranged to transport air
through the air passthrough aperture (47) in a direction that goes
from the air passthrough aperture (47) to the air-directing element
(5), in order to deflect the air at that element in a direction away
from the rotation axis (A) of the fan (3).

17. (currently Amended) A carrier frame for installation of a fan (3) at a predetermined distance from a circuit board (2), ~~which carrier frame (4) comprises~~ comprising

a support member (45) that, in ~~the~~ an installed state, is at a distance from the circuit board (2) and ~~is implemented~~ serves as a carrier for a motor (33) of the fan (3),

which support member (45) is surrounded by an air flow passage (47) that in turn is surrounded by an outer air-guiding member (14) that is joined via at least one joining member (45a) to the support member (45), which joining member (45a) crosses the air flow passage (47);

installation elements (41, 43, 44; 80) being provided for installation of the carrier frame (4) on the circuit board (2); and

an air-directing member (5) being provided on the support member (45) on ~~the latter's~~ a side of the support member (45) facing toward the circuit board (2).

18. (Currently Amended) The carrier frame according to claim 17,

wherein the air-directing element (5) is shaped as implemented ~~approximately in the manner of~~ a bell whose open side faces toward the circuit board (2).

19. (Currently Amended) The carrier frame according to claim 17 ~~or 18~~,

wherein the support member (45) is joined, via struts (45a), to a part (40) located radially outside the air passthrough aperture (47).

20. (Currently Amended) The carrier frame according to claim 19,

wherein the part (40) located outside the air passthrough aperture (47) is ~~implemented in the manner of~~ formed as a tubular segment.

21. (Currently Amended) The carrier frame according to claim 17, further comprising any of claims 17 to 20, wherein
an electronically commutated motor (33) ~~that is implemented for mounting~~ mounted on the support member (45) ~~is provided~~
in order to drive the fan (3).

22. (Currently Amended) The carrier frame according to claim 21,
wherein a circuit plate (6) ~~is implemented~~ adapted
to connect the motor (33) to electrical connecting leads (61),
is arranged between that motor (33) and the support member (45).

23. (Original) The carrier frame according to claim 22,
wherein the circuit plate (6) comprises electronic components
for commutation of the motor (33).

24. (Currently Amended) The carrier frame according to claim 22 ~~or 23~~, in which the electrical connecting leads (62 61) are
guided inside the frame, which leads are ~~embodied~~ formed at their
circuit-board ends with terminals (D) for electrical contacting with
the circuit board (2).

25. (Currently Amended) The carrier frame according to claim 24,
wherein the connecting leads are implemented as wire
connections (61) that are at least partially surrounded by a sheath
(51) ~~that is constituted by parts of the carrier frame (4) and/or of the air-directing element (5).~~

26. (Currently Amended) The carrier frame according to claims 20 ~~and 21~~,
wherein ~~the~~ an outer side of the fan wheel (31) forms,
together with ~~the~~ an inner side (47a) of the part (40) ~~implemented in the manner of~~ configured as a tube section, an annular space (47)
inside which, during operation, ~~the~~ blades (32) of the fan wheel
(31) rotate.

27. (Currently Amended) The carrier frame according to claim 26,

wherein the cross section of the annular space (47) widens adjacent ~~in the region of~~ at least one end portion.

28. (Currently Amended) The carrier frame according to claim 17, wherein the frame has a ~~any of claims 17 to 27, which comprises on its~~ side facing away from the circuit board (2), defining an end surface (42) on which a sealing ring (7) is arranged.

29. (Currently Amended) The carrier frame according to claim 28,

wherein a depression for receiving a fan (3) is ~~provided~~ formed inside the end surface (42).

30. (Currently Amended) The carrier frame according to claim 17, ~~any of claims 17 to 29,~~

wherein the air-directing member (5) is ~~equipped~~ formed with at least one penetration (60, 64, 66, 68, 70, 72, 74, 76, 78).

31. (Currently Amended) A carrier frame for installation on a circuit board (2), which frame ~~is implemented in the manner of~~ resembles an oil-drilling rig and comprises

a platform (117) that is equipped with supporting legs (105, 106, 107, 108) for mounting on the circuit board (2),

~~and which comprises at the~~ a center of the platform (117) being formed with a depression (121, 123) that is ~~implemented for installation of~~ adapted to receive a fan (3) at a distance from the circuit board (2), ~~the~~ an outer wall (123) of the depression (121, 123) forming part of the fan.

32. (Currently Amended) The carrier frame according to claim 31,

wherein the supporting legs (105 to 108) are ~~implemented~~ formed integrally with the platform (117).

33. (Currently Amended) The carrier frame according to claim 31 ~~or 32,~~

wherein the supporting legs (105 to 108) are ~~implemented in~~ at least partially hollow ~~fashion~~.

34. (Currently Amended) The carrier frame according to claim 31, ~~one of claims 31 to 33,~~

wherein at least one supporting leg (107, 108) ~~is equipped~~ with further comprises a latching element (107b, 108b) for latching into an associated opening (113) of the circuit board (2).

35. (Currently Amended) The carrier frame according to ~~any of claims 31 to~~ claim 34,

wherein at least one supporting leg (105, 106) is provided which comprises no latching element and is longer than a supporting leg (107, 108) equipped with a latching element (107b, 108b).

36. (Currently Amended) The carrier frame according to claim

~~34. any of claims 31 to 35,~~

wherein at least one supporting leg (105, 106) is provided which comprises no latching element and comprises, at its free end, a portion (110, 111) whose diameter is ~~implemented in~~ complementary fashion to the diameter of a predetermined opening (112) of the circuit board (2), which opening is associated with that supporting leg.

37. (Currently Amended) The carrier frame according to ~~any of the preceding claims,~~ claim 34, on which are provided electrically conductive elements (61) that are implemented to form, upon installation of the carrier frame on a circuit board (2), ~~an a~~ a respective electrical connection to a counter-element (114) provided on the circuit board.

38. (Currently Amended) The carrier frame according to claim 37,

wherein the electrically conductive elements are implemented as ~~in the manner of~~ pins (61).

39. (Currently Amended) The carrier frame according to claim 37 ~~or 38,~~

wherein the electrically conductive elements (61) are electrically connected to a circuit plate (6) that ~~is implemented~~ serves to deliver electrical energy to a fan (3) arranged on the carrier frame (104).

40. (Currently Amended) The carrier frame according to claim 39, on which the circuit plate (6), in ~~the~~ an installed state, is immobilized in a predetermined position.

41. (Original) The carrier frame according to claim 40, wherein at least one latching spring (140, 142) is provided for immobilization of the circuit plate (6), which spring latches the circuit plate (6) in a predetermined position.